PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Docket No.: HAUF-2

In re Application of:	)
	) **Examiner: McCloud, Renata D.**
RONALD HAUF	)
	) **Group Art Unit: 2837**
Appl. No.: 10/719,615	)
	) **Confirmation No: 3140**
Filed: November 21, 2003	)
	)
For: DRIVE SYSTEM	)

BRIEF OF APPEAL

Mail Stop Appeal Brief-Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

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(Name of Registered Representative)

(Signature) 4-12-2007
(Date of Signature)

S I R:

This is an appeal from the final rejection of claims 1-10by the Primary Examiner. The Brief is being filed under the provisions of 37 C.F.R. §41.37. The amount of $500.00 to cover the requisite fee set forth in 37 C.F.R. §41.20(b)(2) is enclosed.

The Commissioner is hereby authorized to charge fees which may be required, or credit any overpayment to Deposit Account No. 06-0502.

(1) REAL PARTY IN INTEREST

The above-referenced patent application has been assigned to Siemens Aktiengesellschaft, having a place of business at Wittelsbacherplatz 2, 80333 München, Germany, the real party in interest by virtue of an assignment recorded on April 8, 2004 at reel 015195, frame 0694.

(2) RELATED APPEALS AND INTERFERENCES

There are no and there have been no related appeals or interferences that will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

(3) STATUS OF CLAIMS

The following claims are in the appeal proceedings:

Claims 1–10 stand rejected under 35 U.S.C. §112, second paragraph.

Claims 1–10 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Pat. No. 5,333,706 to Mori in view of U.S. Pat. No. 6,213,571 to Yamada et al. and further in view of U.S. Pat. No. 6,531,839 to Shin et al.

(4) STATUS OF AMENDMENTS

Appellant has filed a communication under 37 C.F.R. §1.116 after issuance of the final rejection. In accordance with an Advisory Action by the Examiner in charge of this application, the Request for Reconsideration has not been entered but considered, but was not deemed to place the application in condition for allowance. It is noted for the record that the communication under 37 C.F.R. §1.116 did not contain any amendments to the claims.

(5) SUMMARY OF CLAIMED SUBJECT MATTER

Independent claim 1 recites a drive control system (see FIG. 1) for braking an electric motor in the event of a malfunction. The drive control system includes an integrated armature short-circuit brake (the armature short-circuit brake results from the cooperation between the controller RE and the converter U; see paragraph **[0018]** of the specification, which states "the controller RE can cause the converter U to produce an integrated armature short-circuit in the motor." The drive control system further includes a mechanical brake (MB) and a controller (RE), which simultaneously applies a control signal to the integrated armature short-circuit brake and the mechanical brake at an activation time (see paragraph **[0024]**, line 6) for immediately stopping the electric motor in the event of a malfunction which prevents a controlled slow-down of the electric motor. The armature short-circuit brake is disengaged when a thermal load limit for the electric motor or the controller has been reached. (see paragraph **[0024]**, line 8-11) The delay time of the mechanical brake is longer that the delay time of the armature short-circuit brake.

Independent claim 5 recites a method for instantaneously stopping an electric motor powered by a drive system in the event of a malfunction which prevents a controlled slowdown of the electric motor. The method includes the steps of detecting the malfunction, simultaneously applying at an activation time a control signal to an integrated armature short-circuit brake and a mechanical brake (see paragraph **[0024]**, line 6), and disengaging the armature short-circuit brake when the electric motor or its control electronics reach a thermal load limit. (see paragraph **[0024]**, line 8-11; see also FIGS. 3 and 4)

(6) GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Issue 1–Whether claims 1, 5, 9 and 10 are definite under 35 U.S.C. §112, second paragraph ?

Issue 2–Whether claims 1–10 are patentable under 35 U.S.C. §103 over U.S. Pat. No. 5,333,706 to Mori in view of U.S. Pat. No. 6,213,571 to Yamada et al. and further in view of U.S. Pat. No. 6,531,839 to Shin et al.?

(7) ARGUMENT

A) Issue 1: Rejection of claims 1, 5, 9 and 10 under 35 U.S.C. §112, second paragraph

Claims 1 and 5 were rejected because the phrase "in <u>the</u> event of" allegedly lacks antecedent basis. In the English language, the term "in the event of" is an alternate expression for "if" and does not require antecedent basis. It does not refer to a specific event. Applicant notes that according to the public PAIR database the USPTO has granted 38,894 patents with the qualifier "in the event of" in the claims.

Claims 9 and 10 were rejected because the phrase "so as to" allegedly renders the claim indefinite. The commonly accepted meaning of "so as to" in the English language expresses a consequence of an action. Again, Applicant notes that according to the public PAIR database the USPTO has granted 898,317 patents with the qualifier "so as to" in the claims. Claims 9 and 10 could alternatively have been drafted to read "thereby short-circuiting" instead of "so as to short-circuit." Moreover,

"If the language of the claim is such that a person of ordinary skill in the art could not interpret the metes and bounds of the claim so as to understand how to avoid infringement, a rejection of the claim under 35 U.S.C. 112, second paragraph, would be appropriate. See *Morton Int'l, Inc. v. Cardinal Chem. Co.*, 5 F.3d 1464, 1470, 28 USPQ2d 1190, 1195 (Fed. Cir. 1993). <u>However, if</u> the language used by applicant satisfies the statutory requirements of 35 U.S.C. 112, second paragraph, but <u>the examiner merely wants the applicant to improve the clarity or precision of the language used, the claim must not be rejected under 35</u>

U.S.C. 112, second paragraph, rather, the examiner should suggest improved language to the applicant." (MPEP 2173.02) {Emphasis added}

It is therefore respectfully submitted that the rejection of claims 1, 5, 9 and 10 under 35 U.S.C. 112, second paragraph, should be reversed.

B) Issue 2: Rejection under 35 U.S.C. §103(a) over U.S. Pat. No. 5,333,706 to Mori in view of U.S. Pat. No. 6,213,571 to Yamada et al. and further in view of U.S. Pat. No. 6,531,839 to Shin et al.

Mori discloses a brake apparatus for a vehicle, whereby for achieving a rapid braking action, the disk brake and the electromagnetic brake are, like in the present invention, activated simultaneously. (Col. 2, line 16-27 and col. 4, line 60-68). The examiner asserts that Mori disengages the electromagnetic brake when a certain load limit is reached, citing col. 5, lines 11-15: "In STEP 206, when the vehicle speed is equal to or lower than the threshold speed value, the control circuit 12 only outputs a power signal to caliper 16, and therefore only the disc brake (electric actuator 8) is actuated (STEP 209)." Evidently, **Mori detects** a speed value and **not a load limit**.

The examiner furthermore asserts that the "thermal load limit" may be a minimum and not necessarily a maximum.

The examiner's interpretation of the English term "load limit" contravenes the commonly accepted meaning in the technical literature. The term "load limit" is commonly used to express a maximum (and not a lesser load) that can be applied to a system or a component of the system. A definition can be found, for example, in the McGraw-Hill Dictionary of Scientific and Technical Terms, 5th edition, page 1158. A copy of this page is attached in Section (10) EVIDENCE APPENDIX of this Brief. The dictionary definition clearly states:

> **load limit** [CIV ENG] the maximum weight that can be supported by a structure. {MECH ENG] The maximum recommended or permitted overall weight of container or a cargo-

carrying vehicle that is determined by combining the weight of the empty container or vehicle with the weight of the load.

Mori therefore does not teach disengaging the armature short circuit brake when a *maximum* thermal load limit is reached, as recited in claim 1. Mori's failure to disclose a *maximum* thermal load limit has been explicitly admitted on page 3, lines 7-8, of the office action, stating that Mori does not teach "disengaging the short circuit brake when the thermal load limit is reached." In fact, Mori explicitly states (col. 4, lines 7-19) that "<u>when the vehicle speed decreases below a predetermined value during brake operation</u>, the control circuit 12, which receives a detection signal from the vehicle speed sensor 15, energizes caliper actuator 8 such that only the disc brake (or drum brake) is actuated to produce a brake operation." (Emphasis added).

After admitting in the office action that Mori does not teach the thermal load limit, the office action then asserts that Yamada teaches disengaging the short-circuit brake when a thermal load limit for the electric motor or the controller is reached. However, Yamada doesn't mention anywhere in the patent that a thermal load limit should be taken into consideration in any shape or form.

Yamada discloses a control apparatus for an electric vehicle with an emphasis on achieving a smooth transition between regenerative braking and "plugging" braking. The term "plugging" braking, as it is known in the art, refers to an electric braking operation wherein an electric current is <u>supplied</u> to the motor/generator. Col. 1, lines 56-65, as cited by the examiner, refer to a method, which ensures operation of the control apparatus for an electric vehicle to be maintained even if a contact voltage of the regenerative contactor cannot be detected due to failure of its wiring or the like. **Yamada** detects <u>the absence of a contact voltage</u> of the regenerative contactor during regenerative braking, but **<u>does not detect of a thermal load limit</u>**.

Shin, applied as a third reference, describes braking a motor with a mechanical brake and an electrical brake, wherein the rotation speed of the motor is <u>first reduced by using a mechanical brake method</u> during the high speed rotation

interval to prevent heat occurrence, whereafter when the rotation speed of the motor drops below a predetermined speed, the motor is stopped using an electrical brake method during the relatively low speed interval. This is just the opposite process used in the present invention, which first disengages the electromagnetic (short-circuit armature) brake when a thermal load limit is reached, and thereafter brakes or continues to brake using the mechanical brake. Shin uses the electrical brake method at the end so that the motor can be stopped within a short time. (See Shin's Abstract) Shin does not disclose or suggest a thermal load limit for a short-circuit brake.

The examiner further argues that Applicant applied the arguments against the references individually. This cannot be further from the truth, since at least the limitation recited in claim 1 that "the armature short-circuit brake is disengaged when a thermal load limit for the electric motor or the controller has been reached" is absent from the combination of the references.

The examiner further alleges that Applicant applied the arguments against the references individually. This is not the case, since Applicant has convincingly demonstrated that at least the limitation recited in the independent claims 1 and 5 that "the armature short-circuit brake is disengaged when a thermal load limit for the electric motor or the controller has been reached" is absent in all the references of record.

Applicant therefore contends that the cited references fail to satisfy the criteria for a *prima facie* case of obviousness. Specifically, Applicant contends that the cited references fail to teach or suggest at least that the "the armature short-circuit brake is disengaged when a thermal load limit for the electric motor or the controller has been reached". Because the references, taken alone or in combination, fail to teach or suggest each and every limitation of the claimed invention, the cited references fail to undermine the patentability of the claimed invention.

It is therefore respectfully submitted that the rejection of claims 1– 10 under 35 U.S.C. 103(a) should be reversed.

CONCLUSION

Appellant has invented a system and method for braking an electric motor in the event of a malfunction by disengaging the armature short-circuit brake when a thermal load limit for the electric motor or the controller has been reached.

The cited prior art does neither teach nor suggest all the essential features as defined in claims 1 and 5 of the present invention. There is no teaching in the references of record, taken either alone or in combination, at least of "disengaging the armature short-circuit brake when a thermal load limit for the electric motor or the controller has been reached."

The comments made above are similarly applicable to all of the remaining claims because all of these depend from claims 1 and 5, respectively, and share all features thereof. It is well settled that a dependent claim which depends on an allowable parent claim shares in the allowability and this is therefore true of the remaining claims in the application.

For the above stated reasons, it is respectfully submitted that the rejection of the claims 1–10 issued by the examiner on the references should be reversed.

Respectfully submitted,

By: ______________________
Henry M. Feiereisen
Agent for Appellant
Reg. No.: 31,084

Date: April 12, 2007
350 Fifth Avenue
Suite 4714
New York, N.Y. 10118
(212) 244-5500
HMF/WS:af

(8) CLAIMS APPENDIX

1. A drive control system for braking an electric motor, comprising:

    an integrated armature short-circuit brake having a first delay time,

    a mechanical brake having a second delay time which is longer that the first delay time, and

    a controller simultaneously applying a control signal to the integrated armature short-circuit brake and the mechanical brake at an activation time for immediately stopping the electric motor in the event of a malfunction which prevents a controlled slow-down of the electric motor,

    wherein the armature short-circuit brake is disengaged when a thermal load limit for the electric motor or the controller has been reached.

2. The drive system of claim 1, wherein the thermal load limit is defined by at least one parameter selected from the group consisting of a maximum current, a product of a current and a reaction time, a reaction time and a system temperature.

3. The drive system of claim 2, wherein the at least one parameter is stored in a memory of the controller.

4. The drive system of claim 1, wherein the armature short-circuit brake remains engaged if a danger for personnel or surroundings is detected.

5. A method for instantaneously stopping an electric motor powered by a drive system in the event of a malfunction which prevents a controlled slowdown of the electric motor, comprising the steps of:

    detecting the malfunction,

    simultaneously applying at an activation time a control signal to an integrated armature short-circuit brake and a mechanical brake, and

disengaging the armature short-circuit brake when the electric motor or its control electronics reach a thermal load limit.

6. The method of claim 5, wherein the thermal load limit is defined by at least one parameter selected from the group consisting of a maximum current, a product of a current and a reaction time, a reaction time and a system temperature.

7. The method of claim 6, and further comprising the step of storing the at least one parameter in a memory.

8. The method of claim 5, wherein said disengaging step is postponed if a danger for personnel or surroundings is detected.

9. The method of claim 5, wherein the integrated armature short-circuit brake comprises a converter connected to an armature of the electric motor, with the controller applying the control signal to the converter so as to short-circuit the armature of the electric motor.

10. The method of claim 5, wherein the integrated armature short-circuit brake is formed by operating a converter so as to short-circuit an armature of the electric motor.

(9) EVIDENCE APPENDIX

Copy of page 1158 of McGraw-Hill Dictionary of Scientific and Technical Terms, 5th edition.

(10) RELATED PROCEEDINGS APPENDIX

NONE

McGraw-Hill Dictionary of Scientific and Technical Terms

Fifth Edition

Sybil P. Parker
Editor in Chief

McGraw-Hill, Inc.
New York San Francisco Washington, D.C.
Auckland Bogotá Caracas Lisbon London Madrid Mexico City Milan
Montreal New Delhi San Juan Singapore Sydney Tokyo Toronto

liquid-vapor-contact tower, in which rising vapor lifts or holds falling liquid. [ELEC] The addition of inductance to a transmission line to improve its transmission characteristics throughout a given frequency band. Also known as electrical loading. [ENG] 1. Buildup on a cutting tool of the material removed in cutting. 2. Filling the pores of a grinding wheel with material removed in the grinding process. [ENG ACOUS] Placing material at the front or rear of a loudspeaker to change its acoustic impedance and thereby alter its radiation. [MET] Filling of a die cavity with powdered metal. [NUCLEO] Placing fuel in a nuclear reactor. { 'lōd·iŋ }

loading angle [ORD] Angle of elevation specified for loading a particular weapon with its ammunition. { 'lōd·iŋ ,aŋ·gəl }

loading board [ENG] A device that holds preforms in positions corresponding to the multiple cavities in a compression mold, thus facilitating the simultaneous insertion of the preforms. { 'lōd·iŋ ,bȯrd }

loading coil [ELECTROMAG] 1. An iron-core coil connected into a telephone line or cable at regular intervals to lessen the effect of line capacitance and reduce distortion. Also known as Pupin coil; telephone loading coil. 2. A coil inserted in series with a radio antenna to increase its electrical length and thereby lower the resonant frequency. { 'lōd·iŋ ,kȯil }

loading density [ENG] The number of pounds of explosive per foot length of drill hole. [ORD] A term applied specifically to explosive charges of projectiles, bombs, warheads, and so on; it is the quantity of explosive per unit volume, usually expressed as grams per cubic centimeter. { 'lōd·iŋ ,den·səd·ē }

loading device [COMPUT SCI] Equipment from which programs or other data can be transferred or copied into a computer. { 'lōd·iŋ di,vīs }

loading disk [ELECTROMAG] Circular metal piece mounted at the top of a vertical antenna to increase its natural wavelength. { 'lōd·iŋ ,disk }

loading head [MECH ENG] The part of a loader which gathers the bulk materials. { 'lōd·iŋ ,hed }

loading pan [MIN ENG] A box or scoop into which broken rock is shoveled in a sinking shaft while the hoppit is traveling in the shaft. { 'lōd·iŋ ,pan }

loading program [COMPUT SCI] Program used to load other programs into computer memory. Also known as bootstrap program. { 'lōd·iŋ ,prō·grəm }

loading rack [ENG] The shelter and associated equipment for the withdrawal of liquid petroleum or a chemical product from a storage tank and loading it into a railroad tank car or tank truck. { 'lōd·iŋ ,rak }

loading routine *See* input routine. { 'lōd·iŋ rü,tēn }

loading space [ENG] Space in a compression mold for holding the plastic molding material before it is compressed. { 'lōd·iŋ ,spās }

loading station [MECH ENG] A device which receives material and puts it on a conveyor; may be one or more plates or a hopper. { 'lōd·iŋ ,stā·shən }

loading tray [ENG] A tray with a sliding bottom used to simultaneously load the plastic charge into the cavities of a multicavity mold. [ORD] 1. Trough-shaped carrier on which heavy projectiles are placed so that they can be more easily and safely slipped into the breech of a gun. 2. Hollowed slide which guides the projectiles into the breech of some types of automatic weapons. { 'lōd·iŋ ,trā }

loading weight [ENG] Weight of a powder put into a container. { 'lōd·iŋ ,wāt }

load isolator [ELECTROMAG] Waveguide or coaxial device that provides a good energy path from a signal source to a load, but provides a poor energy path for reflections from a mismatched load back to the signal source. { 'lōd ,ī·sə,lād·ər }

load leveling [ELEC] A method for reducing the large fluctuations that occur in electricity demand, for example by storing excess electricity during periods of low demand for use during periods of high demand. { 'lōd ,lev·ə·liŋ }

load limit [CIV ENG] The maximum weight that can be supported by a structure. [MECH ENG] The maximum recommended or permitted overall weight of a container or a cargo-carrying vehicle that is determined by combining the weight of the empty container or vehicle with the weight of the load. { 'lōd ,lim·ət }

load line [ELECTR] A straight line drawn across a series of tube or transistor characteristic curves to show how output signal current will change with input signal voltage when a specified load resistance is used. [NAV ARCH] A line, pai[...] the outside of a ship, which marks the maximum w[...] the ship is loaded with the greatest cargo which[...] safely. { 'lōd ,līn }

load loss [ELEC] The sum of the copper loss of a[...] due to resistance in the windings, plus the eddy c[...] the winding, plus the stray loss. { 'lōd ,lȯs }

load metamorphism *See* static metamorphism. { [...] ə'mȯr,fiz·əm }

load module [COMPUT SCI] A program in a form[...] loading into memory and executing. { 'lōd ,mäj[...] }

load oil [PETRO ENG] Oil used as a fracturing f[...] mation to stimulate a well to produce. { 'lōd ,ȯil }

load point [COMPUT SCI] Preset point on a magnet[...] which reading or writing will start. { 'lōd ,pȯint }

load power [ELEC] Of an energy load, the ave[...] flow of energy through the terminals of that load whe[...] to a specified source. { 'lōd ,paù·ər }

load profile [ENG] A measure of the time distr[...] building's energy requirements, including the heati[...] and electrical loads. { 'lōd ,prō,fīl }

load regulation [ELEC] The maximum change in[...] voltage or current of a regulated power supply for[...] change in load conditions. { 'lōd ,reg·yə,lā·shən }

load shedding [ELEC] A procedure in which [...] electric power system are disconnected in an attemp[...] failure of the entire system due to overloading. { [...] iŋ }

load shifting [ELEC] In an electric power system[...] of loads from times of peak demand to off-peak ti[...] { 'lōd ,shift·iŋ }

load stabilization *See* load compensation. { 'lōd [...] shən }

loadstone *See* lodestone. { 'lōd,stōn }

load stress [MECH] Stress that results from a [...] gravitational load. { 'lōd ,stres }

load water [PETRO ENG] Water used to prime a w[...] acidizing procedure. { 'lōd ,wȯd·ər }

load waterline [NAV ARCH] The waterline of a f[...] vessel. { 'lōd 'wȯd·ər,līn }

load water plane [NAV ARCH] The water plan[...] loaded vessel. { 'lōd 'wȯd·ər ,plān }

loam [GEOL] Soil mixture of sand, silt, clay, [...] [MET] Molding material consisting of sand, silt, a[...] over backup material for producing massive casting[...] iron or steel. { lōm }

loaming [GEOCHEM] In geochemical prospecting[...] in which samples of material from the surface a[...] traces of a sought-after metal; its presence on the[...] sumably indicates a near-surface ore body. { 'lōm[...] }

LOB *See* line of balance.

Lobachevski geometry [MATH] A system of [...] etry in which the euclidean parallel postulate fails[...] not on a line L has at least two lines through it p[...] Also known as Bolyai geometry; hyperbolic geo[...] bə'chef·skē jē'äm·ə·trē }

lobar pneumonia [MED] An acute febrile disea[...] one or more lobes of the lung, usually following p[...] infection. { 'lō,bär nü'mō·nyə }

lobar sclerosis [MED] Neuroglial proliferation[...] by atrophy of a cerebral lobe leading to mental and[...] deficits; most common in infants and children who[...] prolonged hypoxia. { 'lō,bär sklə'rō·səs }

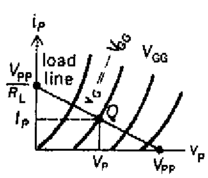
Lobata [INV ZOO] An order of the Ctenophora[...] body is helmet-shaped. { lō'bäd·ə }

lobate [BIOL] Having lobes. [VERT ZOO] Of [...] the skin of the fin extend onto the bases of [...] { 'lō,bāt }

lobate rill mark [GEOL] A flute cast formed by [...] { 'lō,bāt 'ril ,märk }

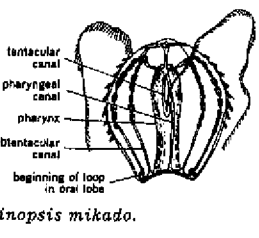
lobe [BIOL] A rounded projection on an orga[...] [DES ENG] A projection on a cam wheel or a no[...] wheel. [ELECTROMAG] A part of the radiation[...] directional antenna representing an area of strong[...] transmission. Also known as radiation lobe. [...] portion of the directivity pattern of a transducer[...] area of increased emission or response. [HYD[...] jection on the margin of a continental ice sheet[...]

LOAD LINE



Load line drawn across characteristic curves giving plate current, i_P, as function of plate voltage, v_P, for various values of grid supply voltage, V_{GG}. V_{PP} = plate supply voltage, R_L = load resistance, v_G = grid voltage. Quiescent point, Q, determines quiescent plate current, I_P, and quiescent plate voltage, V_P.

LOBATA



Bolinopsis mikado.